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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/086,740 | 03/04/2002 | Tetsuo Kosaka | 00862.022537 | 2218 |
| 5514 | 7590 | 10/11/2005 | EXAMINER | |
| FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112 | | | HARPER, V PAUL | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2654 | |

DATE MAILED: 10/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/086,740 | Applicant(s) KOSAKA ET AL. | |
| | Examiner V. Paul Harper | Art Unit 2654 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the references listed in the Information Disclosure Statement dated 6/21/2002 and 7/16/2002. Copies of the Information Disclosure Statements are attached to this office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 10 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In these cases, there is not antecedent basis for the terms "setting means" (claim 10) and "setting step" (claim 20).

3. Claims 8 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In these cases, the acronym "LBG" is indefinite. Please expand its meaning.

The following rejections are given using a reasonable interpretation of the unclear limitations in view of the art.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-5, 7, 10-15, 17, 20, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramaswamy et al. (U.S. Patent 6,009,387), hereinafter referred to as Ramaswamy.

Regarding **claim 1**, Ramaswamy discloses a method for compression and decompression of a speech signal. Ramaswamy's teachings include the following:

- input means for inputting acoustic information (Fig. 1, "Sampled speech");
- analysis means for analyzing the acoustic information input by said input means to acquire feature quantity parameters (Fig. 1, item 10; col. 2, line 41 through col. 3, line 15);
- first holding means for obtaining and holding processing information for encoding on the basis of the feature quantity parameters obtained by said analysis means (features are extracted on a frame by frame basis with inherent storage; col. 3, lines 1-7; Fig. 6, codebook generation);

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- second holding means for holding processing information for a speech recognition process in accordance with the processing information for encoding (Fig. 2 using codebooks);
- conversion means for compression-encoding the feature quantity parameters obtained via said input means and said analysis means on the basis of the processing information for encoding (Fig. 1, item 20; col. 3, lines 7-15); and
- recognition means for executing speech recognition on the basis of the processing information for speech recognition held by said holding means, and the feature quantity parameters compression-encoded by said conversion means (Fig. 1, items 30 and 40; col. 3, lines 16-25).

Regarding **claim 2**, Ramaswamy teaches everything claimed, as applied above (see claim 1). In addition, Ramaswamy teaches:

- said system is built by a first apparatus having said analysis means, said first holding means, and said conversion means, and a second apparatus having said recognition means (see rejection of claim 1 and Fig. 1, noting the transmission operation inherently requiring separate apparatuses), and
- said system further comprises communication means for sending the processing information generated by said first holding means and data acquired by said conversion means from the first apparatus to the second apparatus (Fig. 1; col. 3, lines 12-16, "transmitted in any known manner").

Regarding **claim 3**, Ramaswamy teaches everything claimed, as applied above (see claim 1). In addition, Ramaswamy teaches:

- said second holding means holds processing information used to decode information converted by said conversion means, and said recognition means comprises (Fig. 1; Transmission or Storage before decompression; also inherent storage during processing; Fig. 4, decode using codebooks):
- decoding means for decoding the compression-encoded feature quantity parameters by looking up the processing information held in said second holding means (Fig. 1, item 30, Decompressor; col. 3, lines 15-21; Fig. 4, decode using codebooks), and
- said recognition means executes a speech recognition process on the basis of the feature quantity parameters decoded by said decoding means (Fig. 1, item 40; col. 3, lines 20-26).

Regarding **claim 4**, Ramaswamy teaches everything claimed, as applied above (see claim 2). In addition, Ramaswamy teaches "wherein said second holding means is arranged in the second apparatus" (see rejection of claim 3, inherent storage required for processing in second device separated by transmission operation; col. 3, lines 15-25; Fig. 4).

Regarding **claim 5**, Ramaswamy teaches everything claimed, as applied above (see claim 1). In addition, Ramaswamy teaches:

- said second holding means makes some steps of a likelihood calculation associated with speech recognition on the basis of the processing information for encoding and an acoustic model, and holds the calculation result as the information for speech recognition (Fig. 4; col. 6, lines 27-67), and
- said recognition means obtains a speech recognition result by making a likelihood calculation for data acquired by said conversion means using the information held by said second holding means (Fig. 1, item 40, col. 3, lines 21-25, "signal is recognized in any suitable manner for recognizing spoken utterances known in the art," Fig. 4, "send to recognition engine").

Regarding **claim 7**, Ramaswamy teaches everything claimed, as applied above (see claim 1). In addition, Ramaswamy teaches "said conversion means scalar-quantizes multi-dimensional speech parameters obtained by said analysis means for respective dimensions" (Fig. 4, vector and scalar quantization operations are indicated).

Regarding **claim 10**, Ramaswamy teaches everything claimed, as applied above (see claim 7). In addition, Ramaswamy teaches "setting means changes clustering for the scalar quantization on the basis of the feature quantity parameters obtained by said analysis means" (Fig. 6, process for generating codebooks for compression and decompression; col. 7, lines 40-57);

Regarding **claim 11**, this claim has limitations similar to claim 1 and is rejected for the same reasons.

Regarding **claim 12**, this claim has limitations similar to claim 2 and is rejected for the same reasons.

Regarding **claim 13**, this claim has limitations similar to claim 3 and is rejected for the same reasons.

Regarding **claim 14**, this claim has limitations similar to claim 4 and is rejected for the same reasons.

Regarding **claim 15**, this claim has limitations similar to claim 5 and is rejected for the same reasons.

Regarding **claim 17**, this claim has limitations similar to claim 7 and is rejected for the same reasons.

Regarding **claim 20**, this claim has limitations similar to claim 10 and is rejected for the same reasons.

Regarding **claim 29**, this claim has limitations similar to claim 1 and is rejected for the same reasons.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 6, 16, 21-28, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswamy in view of Grinblat (U.S. Patent Application Publication 2002/0116180 A1), hereinafter referred to as Grinblat.

Regarding **claim 6**, Ramaswamy teaches everything claimed, as applied above (see claim 1). In addition, Ramaswamy teaches the generating of codebooks for compression and decompression (Fig. 6), which corresponds to "...making first and second holding means function, and a speech recognition mode of making said conversion means and said recognition means function." But Ramaswamy does not specifically teach "designation means for selectively executing a learning mode of making said first and second ..." However, the examiner contends that this concept was well known in the art, as taught by Grinblat.

In the same field of endeavor, Grinblat teaches the creation, transmission, and storage of codebooks where the user has the option of creating a codebook (abstract; ¶[0003])

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ramsawamy by specifically providing the features, as taught by Grinblat, because it is well known in the art at the time of invention for the purpose of improving speech recognition performance (¶[0003]).

Regarding **claim 16**, this claim has limitations similar to claim 6 and is rejected for the same reasons.

Regarding **claim 21**, Ramaswamy discloses a method for compression and decompression of a speech signal. Ramaswamy's teachings include the following:

- input means for inputting acoustic information (Fig. 1, "Sampled speech");
- analysis means for analyzing the acoustic information input by said input means to acquire feature quantity parameters (Fig. 1, item 10; col. 2, line 41 through col. 3, line 15;
- holding means for generating and holding processing information for compression-encoding on the basis of the feature quantity parameters obtained by said analysis means (features are extracted on a frame by frame basis with inherent storage; col. 3, lines 1-7; Fig. 6, codebook generation);

- conversion means for compression-encoding the feature quantity parameters of the acoustic information obtained via said input means and said analysis means on the basis of the processing information (Fig. 1, item 20; col. 3, lines 7-15); and
- second communication means for sending data obtained by said conversion means to the external apparatus (Fig. 1; col. 3, lines 12-16, "transmitted in any known manner").

But Ramaswamy does not specifically teach "first communication means for sending the processing information generated by said holding means to an external apparatus." However, the examiner contends that this concept was well known in the art, as taught by Grinblat.

In the same field of endeavor, Grinblat teaches the creation, transmission, and storage of codebooks where the user has the option of creating a codebook and sending it to a remote device (abstract; ¶[0003]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ramaswamy by specifically providing the features, as taught by Grinblat, because it is well known in the art at the time of invention for the purpose of improving speech recognition performance by transmitting updated codebooks to a remote device for use during recognition (¶[0003]).

Regarding **claim 22**, Ramaswamy discloses a method for compression and decompression of a speech signal. Ramaswamy's teachings include:

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- holding means for holding, in a memory, processing information for speech recognition obtained on the basis of the processing information received by said first reception means (Fig. 4);
- second reception means for receiving compression-encoded data from the external apparatus (Fig. 1, transmission of compressed data); and
- recognition means for executing speech recognition of the data received by said second reception means using the processing information held in said holding means (Fig. 1, item 40).

But Ramaswamy does not specifically teach “first reception means for receiving processing information associated with compression-encoding from an external apparatus.” However, the examiner contends that this concept was well known in the art, as taught by Grinblat.

In the same field of endeavor, Grinblat teaches the creation, transmission, reception, and storage of codebooks where the user has the option of creating a codebook and sending it to a remote device (abstract; ¶[0003]).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ramaswamy by specifically providing the features, as taught by Grinblat, because it is well known in the art at the time of invention for the purpose of improving speech recognition performance by transmitting updated codebooks to a remote device (which receives them) for use during recognition (¶[0003]).

Regarding **claim 23**, Ramaswamy in view of Grinblat teaches everything claimed, as applied above (see claim 21). In addition, Ramaswamy teaches:

- decoding means for decoding data received by said second reception means using the processing information held in said holding means (Fig. 1, Fig 4); and
- means for executing a speech recognition process on the basis of feature quantity data decoded by said decoding means (Fig. 1, item 40; col. 3, lines 21-25) .

Regarding **claim 24**, Ramaswamy in view of Grinblat teaches everything claimed, as applied above (see claim 21). In addition, Ramaswamy teaches the following:

- wherein said holding means generates likelihood information on the basis of the processing information received by said first reception means, and a predetermined acoustic model, and holds the likelihood information in the memory (Fig. 4; col. 6, lines 27-67), and
- said recognition means makes speech recognition by making a likelihood calculation on the basis of data received by said second reception means using the likelihood information held in the memory (Fig. 1, item 40, col. 3, lines 21-25, "signal is recognized in any suitable manner for recognizing spoken utterances known in the art," Fig. 4, "send to recognition engine").

Regarding **claim 25**, this claim has limitations similar to claim 21 and is rejected for the same reasons.

Regarding **claim 26**, this claim has limitations similar to claim 22 and is rejected for the same reasons.

Regarding **claim 27**, this claim has limitations similar to claim 23 and is rejected for the same reasons.

Regarding **claim 28**, this claim has limitations similar to claim 24 and is rejected for the same reasons.

Regarding **claim 30**, this claim has limitations similar to claim 21 and is rejected for the same reasons.

Regarding **claim 31**, this claim has limitations similar to claim 22 and is rejected for the same reasons

6. Claims 8, 9, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramaswamy in view of well known prior art (MPEP 2144.03)

Regarding **claim 8**, Ramaswamy teaches everything claimed, as applied above (see claim 7). But Ramaswamy does not specifically teach "wherein the scalar quantization uses an LBG algorithm." However, the examiner takes official notice of the

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fact that the use of the LBG algorithm for the purpose of performing clustering was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ramaswamy such that the LBG algorithm is used during scalar quantization, because this is a well known and efficient algorithm.

Regarding **claim 9**, Ramaswamy teaches everything claimed, as applied above (see claim 7). But Ramaswamy does not specifically teach "wherein the scalar quantization assumes that data to be quantized form a Gaussian distribution, and quantizes with quantization steps having equal probabilities in the distribution." However, the examiner takes official notice of the fact that the assumption that the data is in the form of a Gaussian and that the quantization step have equal probabilities in that distribution is well know in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Ramaswamy such that the above described features are used during scalar quantization, because the Gaussian is a [the most] commonly used distribution and to assign quantization steps that have equal probabilities is the obvious way to get uniform coverage.

Regarding **claim 18**, this claim has limitations similar to claim 8 and is rejected for the same reasons.

Regarding **claim 19**, this claim has limitations similar to claim 9 and is rejected for the same reasons.

Citation of Pertinent Art

7. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

- Huang et al. (U.S. Patent 5,627,939) disclose a speech recognition system employing data compression.
- Kroon et al. (U.S. Patent 5,680,506) disclose a method for speech signal analysis that performs both speech compression and recognition operations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to V. Paul Harper whose telephone number is (571) 272-7605. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/05/2005

V. Paul Harper
Patent Examiner
Art Unit 2654

A handwritten signature in black ink that reads "V. Paul Harper". The signature is written in a cursive style with a large, stylized "V" at the beginning.